MINERALOGY AND PETROGRAPHY.[1]

PETROGRAPHICAL NEWS.—The serpentine of Montville, N. J., occurs in veins and as isolated nodules in crystalline dolomite, and also as a thin coating on irregularly rounded masses of a gray crystalline pyroxene, with the chemical and optical properties of diopside. The examination of thin sections across the contact between the enclosing serpentine and its nucleus of pyroxene shows conclusively that the former is the direct product of alteration of the latter. In almost all cases the resulting serpentine is found to be slickensided and grooved as if it had been shoved along against some hard substance, and had thereby suffered planing. The origin of the pressure producing this shoving is thought by Mr. Merrill[2] to be the increase in volume which the pyroxene undergoes in its change to serpentine. Even when the alteration is complete and no trace of the original pyroxene remains, the origin of the serpentine through the hydration of some magnesium mineral is shown by the crowding of the calcite grains associated with the serpentine into broad fan-shaped masses. Analyses of the pyroxene core and serpentine surrounding it substantiate the conclusions reached by the microscopic study of thin sections.

	SiO_2	MgO	CaO.	Al_2O_3	Fe_2O_3	FeO	Ign.
Pyroxene	54.22	19.82	24.71	.59	.20	.27	.14
Serpentine	42.38	42.14		.07	.97	.17	14.12

From the fact that no veins of quartz are to be found in the serpentine, it is thought that sufficient magnesium was furnished by the dolomite to change all of the silica of the pyroxene into serpentine.—The ophiolite from Thurman, Warren Co., N. Y., is observed by the same author[3] to have originated in the same manner as the serpentine from Montville. In this case, however, the original pyroxene occurs in little grains and concretionary masses scattered through calcite.—The rocks to the north of Lake Bolsena in Italy consist principally of trachytes, according to Klein,[4] and those to the south of a leucite bearing series. The former include olivinitic and non-olivinitic varieties in different members which the amount of plagioclase varies largely. The leucite rocks embrace tephrites, basanites and leucitophyres. The first two contain porphy-

[1] Edited by Dr. W. S. Bayley, Colby University, Waterville, Maine.
[2] Proc. U. S. Nat. Museum. 1888. p. 105.
[3] Amer. Jour. Sci. March. 1889. p. 189.
[4] Neue Jahrb f. Min., etc., B. B. vi p. 1.

ritic crystals of leucite, augite, plagioclase, sanidine, magnetite, apatite, hauyne, nepheline and more or less olivine in a groundmass composed of microlites of leucite, augite and plagioclase, and a very little glass. According to the predominance of one or the other of the constituents they are divided into basaltic, doleritic and tephritic varieties, and these are further subdivided into olivinitic and non-olivinitic sub-varieties. To the northeast of the Lake there is an augite-andesite with a zonal plagioclase in which the different zones possess very different extinction angles. The paper in which these rocks are described contains a fine series of analyses.—An interesting occurrence of basic concretions in the granite of Mullaghderg, County Donegal, Ireland, is described by Hatch.[1] The rock is a dark, coarse-grained, sphene-bearing, hornblende-granitite containing microcline, orthoclase and oligoclase. Sections of orthoclase nearly parallel to the orthopinacoid are traversed by two sets of strongly refracting markings parallel to the cleavage lines. The markings are due to the deposition of a mineral with an extinction of 14° in the formerly existing cleavage cracks. In this granite are flattened spheroids of three or four inches in diameter, which consist of a reddish granite nucleus and a zonally and radially developed periphery composed of plagioclase, magnetite and a little brown mica. A resumè of the literature of spheroidal granites is given and a classification of the spheroids is attempted.—A second[2] paper on the dyke rocks of Anglesey is occupied with a description of the diabases and diabase porphyrites of the islands of Anglesey and Holyhead, England. A hornblende-diabase from a large dyke running along the east side of Holyhead Mountain contains a large amount of apatite, and augite crystals that have been enlarged by the addition of original hornblende material.[3]—Dr. Bonney[4] regards the isolated masses of green sandstone occurring in the sand pits near Ightham in Kent, England, as having originated *in situ* by concretionary action. The individual grains are connected together by chalcedony and quartz, the latter forming a fringe around each one of the grains and the latter filling in the remaining interstices.—Dr. Hatch[5] records the analysis of a micrograntic keratophyre from near Rathdrum, County Wicklow, Ireland.

[1] Quart. Jour. Geol. Soc. 1888. p. 548.
[2] Cf. AMERICAN NATURALIST, 1888. p. 453.
[3] Harker: Geol. Magazine, 1888. p. 267.
[4] Geol. Magazine, 1888. p. 297.
[5] Geol. Magazine, Feb. 1889. p. 70.

The rock consists almost exclusively of a microcrystalline groundmass of quartz and albite in which are a few porphyritic crystals of the latter mineral. These are sometimes broken up into patches divided by narrow seams of feldspathic substance with an extinction different from that of the albite. The analysis yielded:

SiO_2	Al_2O_3 Fe_2O_3	CaO	MgO	K_2O	Na_2O	Ign.
77.29	14.62	tr	.38	.16	7.60	.57

—Gonnard[1] mentions pyrite, oligoclase, emerald, garnet, beryl, calcite, chlorophyllite, apatite and tourmaline as accessory constituents of the gneiss occurring along the banks of the Saône near Lyons, France.—Kloos[2] has examined the thin sections of rocks that have been subjected to great artificial pressure, and finds in them no signs of mineral crushing. He advises care in ascribing to pressure the crushed appearance of minerals in rocks. He is inclined to regard the phenomenon as due to increase in volume under chemical change.—A typical picrite occurring in boulders near St. Germans in the Liskeard District in Cornwall, England, is mentioned by Bonney[3] as containing augite which has been changed successively into brown and green hornblende, and colorless needles of the same mineral, while the original form of the augite has remained. —Glaucophane has been discovered by the same author[4] as a secondary product of augite in a diabase occurring in a block in the Val Chisone, Cottian Alps.—Aggregates of topaz, a little feldspar, kaolin and mica have been found by Salomon[5] in a granular quartz rock (one variety of the greisen) resulting from the silicification of the granite at Geyer in Saxony.—The green-sand from just above the chalk beds in Kent, England, is composed[6] of grains of quartz, flint, feldspar, glauconite, magnetite, spinel, zircon, rutile, tourmaline and occasional grains of garnet, actinolite, epidote and chalcedony.—An eclogite from near Frankenstein in Silesia consists essentially[7] of omphacite and a calcium garnet. The omphacite contains inclusions of smaragdite, and portions of the garnet have passed over into zoisite through the loss of calcium and the assumption of water.

[1] Bull. Soc. Franç. d. Min. XII. p. 10.
[2] Zeits. d. deutsch. geol. Gesell. XL. 1888. p. 612.
[3] Min Magazine, Oct. 1888. p. 108.
[4] Min. Magazine, Dec. 1887. p. 191.
[5] Zeits. d. deutsch. geol. Gesell. XL. p. 570.
[6] Miss. Gardiner: Quart. Jour. Geol. Soc. Nov. 1888. p. 755.
[7] Traube: Neues Jahrb. f. Miner., etc. 1889. I. p. 195.

MINERALOGICAL NEWS.—*New Minerals.*—*Dahllite*[1] occurs as a yellowish white incrustation on red apatite from the Odegärden mine at Bamle, Norway. It is found in little fibres with a density of 3.053 and a composition as follows :

CaO	FeO	Na_2O	K_2O	P_2O_5	CO_2	H_2O
53.00	.79	.89	.11	38.44	6.29	1.37

corresponding to $4\,(Ca, Fe, Na_2, K_2)_3\,(PO_4)_2 + 2\,Ca\,CO_3 + H_2O$. Before the blowpipe the mineral decrepitates without fusing. It is uniaxial and negative.—*Eudidymite*[2] is founa in tabular crystals in the elaeolite syenite of Langesundfiord at Aro, Norway. It is a white mineral with an easy basal cleavage, a hardness of 6, and specific gravity of 2.553. It is minoclinic with $a : b : c = 1.7107 : 1 : 1.1071$ and $\beta = 86^\circ\ 14'\ 27''$. The plane of its optical axis is the clinopinacoid. The acute bisectrix is inclined $58\frac{1}{2}^\circ$ to c in the acute angle β. $2Va = 29^\circ\ 55'$ for yellow light, and the dispersion is inclined with $\rho > \upsilon$ Its analysis yielded:

$S{:}O_2$	BeO	Na_2O	H_2O	
72.19	11.15	12.66	3.84,	corresponding

to Na. H. Be. $Si_3\ O_8$.

—*Lansfordite* is a white mineral resembling calcite. It is described by Genth[3] as forming stalactites 20 mm. in length in an anthracite coal mine at Lansford, Schuylkill Co., Pa. Its composition is $MgO = 23.18$ per cent, $CO_2 = 18.90$ per cent, $H_2O = 57.79$ per cent, $= 3\,MgCO_3 + Mg\,(OH)_2 + 2\,H_2O$. Its hardness is 2.5, and specific gravity 1.692.—*Rare Minerals.*—Messrs. Diller[4] and Whitfield have identified the blue mineral present in fibres penetrating the quartz and plagioclase of the pegmatoid portion of a biotite gneiss at Harlem, N. Y., as *dumortierite.* In thin section the mineral is seen to have a cleavage parallel to $\infty P\bar{\infty}$ and a second parallel to some prismatic plane. It contains long tubular cavities parallel to the vertical axis and is frequently polysynthetically twinned parallel to some plane in the prismatic zone. It has a hardness of 7, and specific gravity of 3.265. The analysis of a specimen of the mineral obtained from a rock composed principally of dumortierite and quartz, from Clip, Arizona, yielded :

[1] Brögger and Bäckström: Oefv. af. Kongl. Vetenskaps Akad. Förh. Stockholm. 1888. No. 7.
[2] Brögger: Nyt. Magazin for Naturv. XXX. II. p. 196.
[3] Genth: Zeits. f. Kryst. XIV. p. 255.
[4] Amer. Jour. Sci. Mch. 1889. p. 216.

SiO_2	Al_2O_3	MgO	B_2O_3	P_2O_5	H_2O
27.99	64.49	tr.	4.95	.20	1.72

equivalent to 3 $Al_8\ Si_3O_{18} + Al(BO_3)_2 + 2\ H_2O$. Damour,[1] who first analysed the mineral regarded it as a simple silicate of aluminuium of the formula $Al_8\ Si_3\ O_{18}$.—Additional observations upon *bertrandite* increase materially our knowledge of this rare mineral. Investigations by Urba[2] upon the crystals coating the faces of feldspar from Pisek, Bohemia, and the walls of cavities in this mineral yield results analogous to those obtained by Penfield[3] in the case of the Mt. Antero crystals. According to Urba $a : b : c = 7191 : 1 : 4206$. In addition to the cleavage parallel to $3\bar{P}\infty$ Urba finds also a very perfect one parallel to oP. The new plane $\frac{4}{9}\breve{P}\infty$ is also discovered. Analysis of the Pisek mineral gave: SiO_2=49.90, BeO=42.62, H_2O=7.94. The Mt. Antero crystals[4] are bounded by the three pinacoids. Of the two basal planes one is flat and the other rounded in consequence of an oscillatory combination with a brachydome. The distribution of the electrical properties of the crystals show them to be hemimorphic, as indicated by the oscillatory combination on one only of the basal planes. The mineral has recently been discovered at Stoneham, Maine. Mr. Penfield[5] has examined crystals from this locality and has identified on them the planes oP, $\frac{1}{2}\bar{P}\infty$, $3\breve{P}\infty$, $\infty\breve{P}\infty$, and $\infty\breve{P}3$. The crystals are double wedge-shaped, are hemimorphic in the direction of their vertical axis, and are elongated parallel to the brachy-axis. One twin with oP as the twinning plane was observed. A calculation of the axial ratio gave $a : b : c = .5973 : 1 : .5688$.—Pisani[6] has analysed *cupro-descloizite* from Zacatecas, Mexico and has found in it:

Vd_2O_5	As_2O_5	PbO	CunO	ZnO	H_2O
17.40	4.78	53.90	8.80	11.40	3.20

The mineral has a brown color on a fresh fracture, and a specific gravity of 6.06.—A new analysis of the very remarkable mineral *melanophlogite* has been made by Pisani.[7] The mineral was found in little colorless cubes associated with calcite, sulphur and celestite in a limestone geode from near Girgenti, Sicily. After purifying as carefully as possible it yielded:

[1] Bull. Soc. Min. d. France. IV. p. 6.
[2] Zeits. f. Kryst. XV. p. 194.
[3] Cf. AMERICAN NATURALIST. 1888. p. 1023.
[4] Penfield. Amer. Jour. Sci., Mch. 1889. p. 210.
[5] Ib. p. 210.
[6] Bull. Soc. Franç. d. Min. XII. p. 38.
[7] Bull. Soc. Franç. d. Min. Dec. 1888 XI. p 298.

SiO_2	SO_3	Fe_2O_3 Al_2O_3	Loss.
91.12	5.30	.43	1.52.

—*Kröhnkite* ($Cu\,SO_4 + Na_2\,SO_4 + 2\,H_2O$) from Chili, is monoclinic, according to Darapsky[1] with $a: b: c = 1 : 2.112: 0.649$. B $= 64° \; 8'$. Its hardness is 2.5, and specific gravity, 1.98.

BOTANY.[2]

THE TREATMENT OF EXSICCATI IN THE HERBARIUM.—Whether exsiccati should be kept as they are published, or cut up and distributed in the Herbarium, is a question of sufficient importance, it seems to me, to warrant a brief consideration. Exsiccati are generally arranged arbitrarily, and unless well indexed, are often labyrinths to those who are unfamiliar with them. Those which have a separate index to each fasciculus are bad enough, but, unfortunately, many of the largest and best sets have no index at all, and those whose indexes are published separately are continually outgrowing them. If distributed in the herbarium, the specimens are always at hand, and a student does not need to examine indexes to see whether a given species is in such or such a set, but can find all the specimens from every set together in the herbarium, thus saving time and patience, and making comparison of specimens more easy. Much of the synonomy becomes in time forgotten and obsolete, and many exsiccati are for this reason almost useless. But if distributed, the synonomy of each specimen can be kept up with the times by means of labels on the sheet on which it is mounted, and thus many specimens made useful which otherwise would be of but little value for reference.

The common objection to cutting up and distributing exsiccati is that it destroys their identity. But in most exsiccati the name, etc., is printed on the label of each specimen, and if not, these labels can easily be stamped. References to exsiccati are, as a rule, by number, but if distributed, the specimens can be found by name without the number, and when found the number is with them to show that they are the specimens referred to. Besides, if distributed, they can be found by many who have not noticed these references.

[1] Neues Jahrb. f. Min., etc. 1889. I. p. 192.
[2] This department is edited by Professor Charles E. Bessey, Lincoln, Neb.